Claims

1. A nucleic acid construct comprising a nucleic acid sequence comprising a reporter gene encoding a reporter protein that is secretable as a protein or product from a cell where it is expressed or produced and that is excretable from a whole animal.

2. A nucleic acid construct according to claim 1 wherein the secretable/excretable protein or product is produced by modulated gene transcription.

3. A nucleic acid construct according to claim 1 wherein the secretable/excretable protein or product is produced by increased reporter translation.

4. A nucleic acid construct according to claim 3 wherein the increased reporter translation is as a result of increased stability or decreased turnover of mRNA.

5. A nucleic acid construct according to claim 1 wherein the secretable/excretable protein or product is produced by post-translational modulation.

6. A nucleic acid construct according to claim 5 wherein the post-translational modulation is increased reporter stability through removal of polyubiquination or as the result of accumulation or excretion of small molecule metabolites

7. A nucleic acid construct according to any preceding claim further comprising a peptide tag optionally in the form of an epitope tag.

8. A nucleic acid construct according to any preceding claims additionally comprising a promoter element upstream of the (i) a nucleic acid sequence encoding a secreted/excreted protein, and/or (ii) a nucleic acid sequence encoding a peptide tag.

9. A nucleic acid construct according to any preceding claim wherein the secreted/excreted reporter protein is SEAP.

10. A nucleic acid construct according to claim 9 wherein the construct further includes a CypA1 promoter.

11. A nucleic acid construct according to any of claims 1 to 8 wherein the secreted/excreted reporter protein is a modified human β choriogonadotrophin (hCG) molecule.

12. A nucleic acid construct according to claim 11 wherein the construct further includes a stratifin gene promoter.

13. A nucleic acid construct according to either claim 11 or 12 wherein the hCG is tagged.

14. A nucleic acid construct according to claim 13 wherein the hCG is myc-tagged.

15. A nucleic acid construct according to any of claims 1 to 8 wherein the secreted/excreted reporter protein/product is selected from the group comprising hormonal molecules, antibodies and enzymatic molecules..

16. A nucleic acid construct according to claim 15 wherein the hormonal molecule is FSH.

17. A nucleic acid construct according to claim 15 wherein the antibody is a γ or light chain (Bence Jones) protein.

18. A nucleic acid construct according to claim 15 wherein the enzymatic molecule is feline urinary carboxylase.

19. A host cell transfected with at least one nucleic acid construct according to any one of claims 1 to 18.

20. A cell line transfected with at least one nucleic acid construct according to any one of claims 1 to 18.

21. A transgenic non-human animal in which the cells of the non-human animal express the protein encoded by the nucleic acid construct according to any one of claims 1 to 18.

22. A transgenic non-human animal according to claim 21, in which the non-human animal is a mammal.

23. A transgenic non-human mammal according to claim 22, in which the mammal is a mouse.

24. A transgenic non-human animal according to any one of claims 21 to 23 wherein the secreted/excreted reporter product or protein or molecule is excreted in a body fluid selected from the group comprising urine, saliva, tears, milk, cerebrospinal fluid and semen.

25. A transgenic non-human animal according to any one of claims 21 to 24 wherein the secreted/excreted reporter product or protein or molecule is excreted in urine.

26. A host cell according to claim 19 or cell line according to claim 20 or a transgenic non-human animal according to any one of claims 21 to 25 wherein the secreted/excreted reporter moiety is of relatively low molecular weight, in the region of < 60-120kDa.

27. A host cell according to claim 19 or a cell line according to claim 20 or a transgenic non-human animal according to any one of claims 21 to 25 wherein the secreted/excreted reporter moiety possesses a hydrophilic globular tertiary structure,

has low bio-activity is and is clearly distinguishable from native molecules so that it is readily detectable and quantifiable.

28. A host cell according to claim 19 or a cell line according to claim 20 or a transgenic non-human animal according to any one of claims 21 to 25 comprising more than one nucleic acid construct according to claims 1 to 18.

29. Use of a nucleic acid construct according to any one of claims 1 to 18 for the detection of a gene activation event resulting from a change in altered metabolic status in a cell *in vitro* or *in vivo*.

30. Use according to claim 29, in which the gene activation event is the induction of toxicological stress, metabolic changes, or viral, bacterial, fungal or parasitic infection.

31. A method of detecting a gene activation event in a cell *in vitro* or *in vivo*, comprising assaying a host cell stably transfected with a nucleic acid construct in accordance with any one of claims 1 to 18, or a transgenic non-human animal according to any one of claims 21 to 25, in which the cell or animal is subjected to a gene activation event that is signalled by expression of a secreted/excreted reporter protein optionally the protein being tagged with an epitope.

32. A method of screening for, or monitoring of, toxicologically induced stress in a cell or a cell line or a non-human animal, comprising the use of a cell, cell line or non human animal which has been transfected with or carries a nucleic acid construct according to any one of claims 1 to 18.

33. A method for screening and characterising viral, bacterial, fungal, and parasitic infection or for screening for cancer, inflammatory disease, cardiovascular disease, metabolic disease, neurological disease and disease with a genetic basis comprising the

use of a cell, cell line or non human animal which has been transfected with or carries a nucleic acid construct according to any one of claims 1 to 18.